

Material and Methods: By light, scanning and transmission electron microscopy methods and morphometry, structural changes of the organs of patients (P) in pathology and changes in the correlation of PFE in peripheral blood were studied in such lesions as: psoriasis (30 P), lichen ruber planus (32 P), eczema (36 P), neurodermatitis (34 P), periodontitis (42 P) and bleeding, encephalopathy in liver cirrhosis (24P). ILIB and PLIB were conducted every other day, duration 30min (10–12 treatments) using the apparatus "Matrix-VLOK", radiating head KL-VLOK – a special needle with a teflon coating, the wavelength – 0.63 microns, the power output of the optical fiber 1.5–2 mW. PLIB and local irradiation of pathological foci was performed using the apparatus "Mustang 017-MCS-PC", with a magnetic attachment, which creates the magnetic field 50 MLT. Laser therapy was carried out with exposure by 5 min, frequency 1000 Hz, 15–16 treatments.

Results: Shift of varying degree in the ratio of the D and PFE occurred in all studied types of pathology. Portion of D decrease from 1.2 till 2 times. It depends from form of pathology. This is accompanied by corresponding specific changes of structures in the foci of affected organs. It is characteristic, that the percentage of PFE is higher in 1.5–2 time in the blood obtained from lesions, than in peripheral blood of the same patients, affected by skin disease and periodontitis. Isolated local laser irradiation and the isolated use of ILIB and PLIB cause pronounced reduction of changes in organ and normalization of red blood cells. The most pronounced effects of normalization occur at the integrated use of blood irradiation together with local irradiation of pathological lesions. Among the methods of irradiation of blood, most efficient ILIB was at a wavelength of 0.63 microns. Local irradiation of foci of pathological changes, not only leads to reduction of specific alterations of the structure, but also to the marked normalization of the ratio: D PFE. This is especially pronounced in case of laser therapy of periodontitis.

Integrated laser therapy causes normalization of erythrocytes' forms in the lumina of microvessels and a reduction of intravascular microthrombi, which leads to normalization of microcirculation.

Conclusion: The local laser influence and laser irradiation of blood leads to a reduction of changes in the lesion focus and normalization of relations of D and PFE. The most effective is – integrated local irradiation of pathological lesions with ILIB.

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Effectiveness of laser photobiomodulation of InGaAlP on wound healing and GaAlAs laser on the blood sugar amount in diabetic rats

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Objective: The aim of this investigation was to evaluate the effects of laser photobiomodulation at $\lambda = 630$ nm on wound healing and $\lambda = 650$ nm on blood sugar amount in diabetic Rats.

Background: Amputation is one of the important side effects of diabetes. According to WHO reports, the number of diabetic patients will be doubled till 2050 and these patients will be at risk of amputation 22 times more. Low level laser therapy has been suggested as an alternative (non-drug) method of therapy to reduce the blood sugar and also improving the chronic and resistant wound healing.

Materials and Methods: A superficial (deep) skin wound measuring 10 mm was created on dorsum of 40 male Sprague-Dawley rats by hole punch that were diabetic induced by intraperitoneal injection of streptozocin and divided into 5 groups. Two groups were treated by irradiating InGaAlP 630 nm laser (4 J/cm^2) within the wound area. The first group treatment was started 24 hours and the second one 4 days after creating the wound and the treatments were repeated at 24-hour intervals over 5 days. Beside to measuring the repaired area, rate of healing was evaluated

by biomechanical (tensiometer) and biochemical (Hydroxyprolin) assays. The third group was treated by intravenous irradiation of GaAlAs 650 nm (1.5 mW, 2 min, 5 times a week for 3 weeks) through the vein of the tail. The 2 other groups were control for each one.

Results: We found that healing in the animals receiving 630-nm laser energy was accelerated and the total amount of collagen was significantly increased. Although the blood was decreased after laser therapy, however no significant difference was seen in blood sugar between the case and control group.

Conclusions: The use of 630 nm at 4 J/cm^2 is effective in improving the cutaneous wounds healing.

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Vacuum-photon-magnetic massagers of V. Korobov–A. Korobov "Barva-Pneumo/FM"

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Introduction: Nowadays it is well known that massage, light and magnetic field have great influence on the blood and lymph microcirculation, which are the major part of the normal human physiology. Providing of simultaneous effect of these three factors on organism is of great interest for practical medicine. The purpose of the work was to create the device in which the combination of vacuum massage, light therapy and magnetic therapy will be realized. Hereinafter such devices will be called vacuum-photon-magnetic massagers for convenience.

Description of design of vacuum-photon-magnetic massagers:

The major functional element of vacuum-photon-magnetic massager is vacuum chamber equipped with light source and constant magnet. The vacuum chamber placed on human's body after switching the compressor on creates two specific zones. The first zone is under vacuum chamber and is characterized by the lowered air pressure that provides the enhanceable inflow of blood in tissues being under the vacuum chamber. The second zone is in the place of contact of vacuum chamber butt with humans' body and is characterized by enhanceable pressure on tissues that leads to displacement of blood from the contact zone.

In accordance with specificity of zones formed by vacuum chamber two methods of photoeffects on these zones are realized. Herewith magnetic field of constant magnet has practically identically operates in both zones.

We have developed several modifications of vacuum chambers for vacuum-photon-magnetic massagers. Vacuum chambers differ both in geometry, place of light sources situations and light sources by themselves. Semiconductor lasers or light-emitting diodes with radiation in different spectral ranges were used as light sources.

Conclusion: The developed vacuum-photon-magnetic massagers of V. Korobov–A. Korobov "Barva-Pneumo/FM" enabled combination in one device of three major methods of treatment and prevention of the most widespread human diseases.

"Barva-Pneumo/FM" massagers enable conduct of effective instrumental massage of practically any human body zone and provide effective mechanical, light and magnetic effect on blood, lymph and other patient's tissues both in superficial and in deeply situated human body zones.

Vacuum-photon-magnetic massagers of V. Korobov–A. Korobov "Barva-Pneumo/FM" are used with high efficacy in clinical hospitals, sanatoriums, in sports medicine, in rehabilitation of divers, cosmetology, in household use by patients themselves.